

REMARKS

Claims 1-20 remain in the application. By this amendment claims 1, 2, 3, 6, 9, 10, and 16 have been amended. Claims 4, 5, 7, 8, 11-15, and 17-20 remain in original form. The specification has been amended to correct typographical errors contained therein.

REJECTION OF CLAIMS 1-20 UNDER 35 U.S.C. § 112

Claims 1-20 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is respectfully traversed.

Claims 1, 2, 3, 6, 7, 9, 10, and 16 were amended to more particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is believed the amendments to claims 1, 2, 3, 6, 9, 10, and 16 overcome the rejection under 35 U.S.C. § 112, second paragraph, and place them in condition for allowance.

Claims 4, 5, 7, and 8 depend either directly or indirectly from claim 1 and are believed allowable for at least the same reasons as claim 1.

Claims 11-15 depend either directly or indirectly from claim 9 and are believed allowable for at least the same reasons as claim 9.

Claims 17-20 depend from claim 16 and are believed allowable for at least the same reasons as claim 16.

REJECTION OF CLAIMS 9-15 UNDER 35 U.S.C. § 103(a)

Claims 9-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jones (U.S. Patent No. 3,801,182). This rejection is respectfully traversed.

Jones teaches in column 2, lines 10-29, a system for scanning label 10 as it moves along in a direction of label travel represented by arrow 20 generally parallel to the horizontal stripes on the label. Light from laser or other light source 11 is focused by lens system 16 through aperture 13a of apertured mirror 13 upon a multifaceted scanning mirror 14 after passing through aperture 17 and left hand circular polarizer 19. The rotation of scanning mirror 14 causes the

circularly polarized light beam to scan repetitively through a vertical scan angle θ . If an object bearing label 10 intersects this scan angle, scanning mirror 14 reflects light from the label for reflection by mirror 13. Lens system 12 then focuses this reflected light upon photodetector 18 after passing through right hand polarizer 15.

Applicants, on the other hand, teach on page 10, lines 10-14, that an advantage of the present invention is that all the wafers can be view simultaneously, thereby allowing direct comparisons between the marks on the wafers. Another advantage of applicants' invention is that it is a unitary apparatus having no movable parts. Accordingly, applicants' amended claim 9 calls for, among other things, a structure comprising first and second plates, said first plate vertically spaced apart from said second plate and said first plate having first and second major surfaces and at least one slot extending into said first plate from the first major surface, the at least one slot for accepting the wafer, wherein a portion of the wafer having the scribe mark extends through the at least one slot, a back support having a scribe mark reading area that has at least one gradation, and a first vertical support coupling a first portion of said first plate to a first portion of said second plate, wherein the first vertical support has a trapezoidal shape, and wherein the structure has no movable parts. At least these elements of applicants' amended claim 9 are not taught or suggested by the relied on reference of Jones. Thus, the relied on reference is deficient in making obvious applicants' amended claim 9.

Claims 10-15 depend either directly or indirectly from claim 9 and are believed allowable over the relied on reference of Jones for at least the same reasons as claim 9.

REJECTION OF CLAIMS 1 AND 16 UNDER 35 U.S.C. § 103(a)

Claims 1 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McGarry et al. (U.S. Patent No. 5,861,910). This rejection is respectfully traversed.

McGarry et al. teach in column 5, lines 25-63, a mirror-like substrate 12, such as a semiconductor wafer or magnetic recording media, the substrate 12 having indicia 14 on its reflective surface. In FIG. 1A, the image formation apparatus 10 is in a direct illumination and viewing position. FIG. 1C shows the image formation apparatus 10 in an indirect viewing and illuminating position, wherein the optical paths for viewing and illumination are folded by a mirror assembly 16. Those skilled in the art will appreciate that many other indirect viewing and

illuminating positions are made possible by other mirror arrangements. The indirect viewing and illuminating positions, such as shown in FIG. 1C, are important for use in conjunction with some of the current installed base of semiconductor device fabrication equipment that provide only limited space for illuminating and viewing apparatus.

FIGS. 1A and 2 show that the image formation apparatus of McGarry et al.'s invention includes in a preferred embodiment, a standard video camera 18, and a lens 20 such as a Pulnix TM-7EX camera with a D.O. Industries Navitron TV lens, being 25 mm and F1.4. This preferred embodiment also includes a printed circuit board 22, having a plurality of illumination elements 24 and 25, such as a plurality of round and rectangular light emitting diodes (LEDs). Further the embodiment includes a diffuser layer 26 for brightfield illumination having cut-out areas and diffuser areas. In masking relationship with the diffuser layer 26 is the opaque mask layer 28 that has cut-out areas that expose both the diffuser layer 26 and the illumination elements 24 directly. Rectangular LEDs 25 reside behind the unmasked portion of the diffuser layer 26.

Referring to FIG. 1B, the apparatus 10 of FIG. 1A is seen from the position of the reflective substrate 12, e.g., a semiconductor wafer. There is a plurality of illumination elements 24, e.g., an array of LEDs 24. Also, there is a diffuser region 26 for providing brightfield illumination, behind which is a plurality of rectangular LEDs 25.

McGarry et al. further teach in column 6, lines 63-67, and continuing to column 7, lines 1-8, that FIG. 2 shows how the layers 26 and 28, the PCB 22, the lens 20 and the camera 18 are assembled. Specifically, screws 46, brackets 48, and posts 50 are used to space the various components such that the components are as close as possible, without touching. The distance of the slot aperture 34 in the PCB 22 from the lens 20 is not critical. In fact, the slot can advantageously be included within the lens system, before the lens system, or after the lens system. Specifically, a slot aperture can be included between the image sensor of the camera 18 and preferably close to the lens 20. Alternatively, an elongated slot aperture can be painted on the lens 20 using opaque paint, or other opaque coating.

Applicants, on the other hand, teach on page 3, line 27, and continuing to page 5, line 24, that in accordance with a first embodiment, scribe reader 10 comprises a wafer receptacle or top plate 11 spaced apart from a bottom or base plate 12, a front support 13 spaced apart from and substantially parallel to a back support 14, and a vertical support 17 spaced apart from and

substantially parallel to an opposing vertical support 18. Wafer receptacle 11 is also referred to as a wafer support side, and back support 14 is also referred to as a scribe mark side, a mark reading side, or a wafer reading area. By way of example, wafer receptacle 11, base plate 12, front support 13, and back support 14 are each rectangularly shaped sections that are coupled together to form the body of scribe reader 10. Wafer receptacle 11 and base plate 12 have front, back, right, and left sides. Front support 13 and back support 14 have lower, upper, right, and left sides. It should be understood that the use of the terms front, back, right, and left are merely used for descriptive purposes and are not a limitation of the present invention. For example, the right side of front support 13 and the left side of back support 14 are coupled by vertical support 17. The lower side of front support 13 is attached to the front side of bottom plate 12 and the lower side of back plate 14 is attached to the back side of bottom plate 12. Front support 13 and back support 14 are attached to bottom plate 12 such that front and back supports 13 and 14, respectively, are substantially perpendicular to bottom plate 12 and parallel to each other. The upper side of front support 13 is attached to the front side of wafer receptacle 11 and the upper side of back support 14 is attached to the back side of wafer receptacle 11. Thus, wafer support 14 is vertically oriented.

Front support 13 and back support 14 have a lateral dimension indicated by arrows 16. Front support 13 has a vertical dimension indicated by arrows 22 and back support 14 has a vertical dimension indicated by arrows 27. Lateral dimension 26 of front and back supports 13 and 14, respectively, are preferably the same; however, vertical dimension 27 of back support 14 is greater than vertical dimension 22 of front support 13. In other words, back support 14 is taller than front support 13. Thus, wafer receptacle 11 is angled or beveled with respect to bottom plate 12. ... Preferably, wafer receptacle 11, base plate 12, front support 13, and back support 14 are sheets of a plastic material such as, for example, Plexiglas, which are glued together to form the body of scribe reader 10. The method of attaching wafer receptacle 11, plate 12, and supports 13 and 14 together is not a limitation of the present invention. For example, the plates and supports can be screwed together, nailed together, taped together, frictionally fit together, or the like.

Scribe reader 10 further includes a right vertical support 17 and a left vertical support 18, which are quadrilateral structures where each has an upper side, a lower side, a front side, and a back side. The lower side of vertical support 17 is attached to the right side of bottom plate 12

and the upper side of vertical support 17 is attached to the right side of wafer receptacle 11. The front side of vertical support 17 is attached to the right side of front support 13 and the back side of vertical support 17 is attached to the left side of back support 14. The lower side of vertical support 18 is attached to the left side of bottom plate 12 and the upper side of vertical support 17 is attached to the left side of wafer receptacle 11. The front side of vertical support 18 is attached to the left side of front support 13 and the back side of vertical support 18 is attached to the right side of back support 14. It should be understood that front support 13 and vertical supports 17 and 18, individually or collectively, are optional. An advantage of including front support 13 and vertical supports 17 and 18 is that they provide additional structural support to scribe reader 10. Further, the shape of vertical supports 17 and 18 is not a limitation of the present invention. For example, they can be rectangular, circular, oval, polygonal, or any other geometric shape.

A plurality of slots 29 are formed in wafer receptacle 11, wherein each slot 29 has a length denoted by arrows 31 and a width denoted by arrows 32. Preferably, slots 29 have a length that is less than the diameter of wafer 20 and a width that is at least five percent greater than the width of wafer 20. ... In the embodiment shown in FIG. 1, wafer receptacle 11 has twenty-five slots, wherein the lateral distance between adjacent slots is 0.7 cm. It should be noted that the number of slots and the distance between the slots is not a limitation of the present invention. In this embodiment, the number of slots was selected to match the number of wafers held in a standard cassette used in the processing of semiconductor wafers. However, there may be more or fewer than twenty-five slots.

Accordingly, applicants' amended claim 1 calls for, among other things, a support structure comprising a back support having an upper side, a lower side, a first vertical support side, and a mark reading area, wherein the mark reading area has at least one gradation, a vertical support having first, second, and third sides, the first side coupled to the first vertical support side of the back support, and a wafer support having a first side coupled to the upper side of the back support and a second side coupled to the second side of the vertical support, the wafer support having first and second major surfaces and at least one slot extending into the wafer support from the first major surface, the at least one slot for receiving said wafer such that a portion of said wafer having the mark extends through the at least one slot. Applicants' amended claim 16 calls for, among other things, providing a support structure comprising a back support

having an upper side, a lower side, a first vertical support side, and a mark reading area, wherein the mark reading area has at least one gradation, a vertical support having first, second, and third sides, the first side coupled to the first vertical support side of the back support, and a wafer support having a first side coupled to the upper side of the back support and a second side coupled to the second side of the vertical support, the wafer support having first and second major surfaces and at least one slot extending into the wafer support from the first major surface, the at least one slot for receiving said wafer, wherein a portion of said wafer having the scribe mark extends through the at least one slot. At least these elements of applicants' amended claims 1 and 16 are not taught or suggested by the relied on reference of McGarry et al. Accordingly, the relied on reference of McGarry et al. lacks the supposition of obviousness as set forth under 35 U.S.C. § 103.

CONCLUSION

No new matter is introduced by the amendments herein. Based on the foregoing, applicants believe that all claims under consideration are in condition for allowance. Reconsideration of this application is respectfully requested.

Respectfully submitted,

Dated: 28 October 2004 Rennie William Dover
Rennie William Dover, Reg. No. 36,503
THE CAVANAGH LAW FIRM
1850 N. Central Avenue, Ste. 2400
Phoenix, Arizona 85004
Telephone: (602) 322-4000